



**UNITED STATES DEPARTMENT OF COMMERCE**  
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
097642,883	08/22/00	KOIKE	M 001035

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EXAMINER

CHANG, A

ART UNIT PAPER NUMBER

2872

DATE MAILED: 09/26/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

**Office Action Summary**

Application No.

09/642,883

Applicant(s)

KOIKE ET AL.

Examiner

Audrey Y. Chang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the method for producing the plane diffraction grating including the steps of coating, covering, etching and rotating recited in claim 11 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-5, 6-10 and 11-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase "rotational position of the area" recited in claims 1, 6 and 11 appears to be vague and indefinite since it is not clear what does it mean by "rotational position". Also the phrase "the rotational position ... about a rotational center as a foot of the rotational axis on the surface" recited in claims 1 and 6 and the phrase "the rotational position of the area about a rotational center" recited in claim 11 appear to be vague, indefinite and in error. Since a rotation is in general defined with respect to an axis not a point. A "rotational center" is really a point on the surface and there is no way to define a rotational motion with respect to a point. Claim 1 further recites that the rotational axis is normal to the surface; this implies that the rotational motion of the grating with respect to the axis could be either restricted on the plane of the grating in azimuthal direction or in an angular direction that perpendicular to the plane of the grating. It is therefore not clear which rotational motion is referred here. Claim 6 further fails to

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provide antecedent basis for the term “the rotational axis” and claim 11 further fails to define what is the “rotational center” which make the scope of the claims unclear.

The term “ $\phi$ ” recited in claims 2-5, 7-10 and 12-15 appears to be vague and indefinite since the claims fail to define such term. The phrase “an original line” recited in claims 2-5, 7-10 and 12-15 also appears to be vague and indefinite since such line is not definitely defined. It is noted that such original line must be definitely defined in order for the angle  $\phi$  to be definitely defined, since for a rotatable plane such as the diffraction grating plane one can arbitrarily choose any line as such original line and if so the functions would have no meaning since the values of  $\phi$  will be arbitrary. Such indefiniteness makes the scope of the claims unclear.

In claims 3, 5, 8, 10, 13 and 15, the claims fail to explain why the wavelength of the light diffracted from the original line is different from the wavelength of the light diffracted from the area along the line different from the original line. In particular, for claims 5, 10 and 15 dependent from claims 4, 9, and 14, the wavelength of the light diffracted from the area along the line are different from their respect base claims 4, 9 and 14 for the same grating groove area, which makes the claims in error.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by the patent issued to Hasegawa et al.

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Hasegawa et al teaches a rotatable hologram (802, 902 or 90) having grating grooves formed on the surface wherein the hologram is rotatable about an axis normal to the plane surface of the hologram with the profile of the grating grooves dependent on the azimuthal angle of the rotation, (please see Figures 73(B), 76 and 78). With regard to claim 6, Hasegawa et al teaches that the rotatable hologram is employed in an optical scanning system with a mechanism for rotating the hologram and a light source for generating convergent beam of light onto the rotatable hologram, (please see Figures 73(A) and 62). This reference has therefore anticipated the claims.

*Claim Rejections - 35 USC § 103*

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Hasegawa et al in view of the patent issued to Ohkura et al (PN. 5,238,785).

Hasegawa et al teaches a rotatable hologram (802, 902 or 90) having grating grooves formed on the surface wherein the hologram is rotatable about an axis normal to the plane surface of the hologram with the profile of the grating grooves dependent on the azimuthal angle of the rotation, (please see Figures 73(B), 76 and 78). This reference has met all the limitations of the claims with the exception it does not teach explicitly that the holographic grating is formed by the method steps claimed. Ohkura et al teaches a method for the manufacture of a diffraction grating wherein the method comprises the step of coating a photo-resist layer (42) on a substrate (31), the step of covering the resist partially with a semi-transparent mask (43), serves as the sector mask, the step of exposing the photo-resist layer and developing the layer to form a mask with intended diffraction grating pattern (45a) and the step of etching

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the substrate to form the diffraction grating pattern on the substrate, (please see Figures 3(a) to 3(e) and column 6). Ohkura et al teaches that the grating forming area is restricted by the semi-transparent mask, which implicitly means that the mask is moved around so that the full grating may be formed. It would then have been obvious to one skilled in the art to apply the teachings of Ohkura et al for the benefit of actually making the rotatable hologram grating by the standard etching process.

*Allowable Subject Matter*

8. Claims 2-5, 7-10 and 12-15 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter: Of the prior art references considered, none has disclosed a plane diffraction grating of a blazed type wherein the blaze angles of the grating grooves along a line making an azimuthal angle  $\phi$  with respect to an original line assume the claimed functions that are functions of such azimuthal angle  $\phi$ . The diffraction grating also has multiple-layer coating with a unit thickness determined by the claimed functions. The diffraction grating also may assume laminate structure wherein the depth of the grooves along a line making the azimuthal angle  $\phi$  with respect to the original line is determined by the claimed function. A multi-layer coating is also provided on the laminated grating wherein the unit thickness of the coating is determined by the claimed functions.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 703-305-6208. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

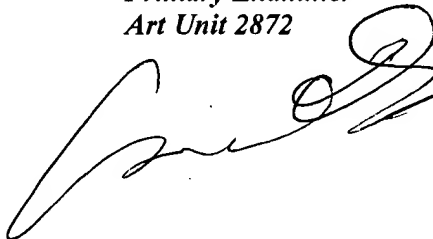
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cassandra Spyrou can be reached on 703-308-1637. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

*Audrey Y. Chang*  
*Primary Examiner*  
*Art Unit 2872*

A. Chang, Ph.D.  
September 21, 2001

A handwritten signature in black ink, appearing to be 'Audrey Y. Chang', written over the printed name and title.